

MORPHOMETRIC STUDY OF THE EQUINE FETLOCK AND COFFIN JOINTS

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Few information is available about the morphometric structure of osteochondral tissues in horses though osteo-articular pathologies may cause pain, handicaps and also important economic loss.

The aim of this study was to improve knowledge about bone and cartilaginous tissues in the horse, especially regarding metacarpo-phalangeal and distal interphalangeal joints.

Samples were taken from both forelimbs of 4 clinically sound french trotter horses aged four to six years (2 geldings and 2 mares). Four sampling sites were used for each joint: 2 proximal (1 medial, 1 lateral) and 2 distal (1 medial, 1 lateral) opposite to proximal sampling sites.

Osteo-cartilaginous samples, of a diameter of 5 mm over a length of 8-10 mm were taken owing to a surgical motor with a bell mill. The samples were either decalcified (to study cartilage) with a commercial mixture of HCl and EDTA or embedded in methyl metacrylate without previous decalcification (to examine bone). Sections were stained with toluidine blue (decalcified sections) and Goldner trichrome or methylene blue (non decalcified sections).

Sections were imaged with a microscope provided with a video camera connected to a computer. Five measurements were realised with the imaging system analysis (Leica Analysis System): maximal thickness of full cartilage, maximal thickness of calcified cartilage, thickness and porosity of subchondral bone and porosity of cancellous bone. For each variable, the effect of the following factors was studied: animal, sex, member, joint (fetlock, coffin), level (distal or proximal), site (medial or lateral). Student-t-test and ANOVA were used for statistical analysis. Significant level was set at $p < 0.05$.

Significant differences were observed between animals, joints and levels. These differences are related to different strain zones within and between joints. There was no significant differences between mares and geldings, or between right and left limbs.

This study helped to lay down the base of subsequent studies which will concern a large number of horses of various morphologies and ages, clinically sound or presenting osteo-articular pathologies.